

**WHAT IS CLAIMED IS:**

1. An automatic gain control device, comprising:

a first control loop for receiving an input voltage and generating a first AGC

voltage;

5 a second control loop for receiving the first AGC voltage, registering the first

AGC voltage in a digital format, and outputting a second AGC voltage;

and

a multiplexer for receiving the first AGC voltage and the second AGC voltage

and choosing one of the voltages as an AGC voltage according to a hold

10 signal.

2. The AGC device according to claim 1, wherein the first control loop comprises:

a variable gain amplifier for receiving the input voltage and amplifying the input voltage to generate an output voltage according to the AGC voltage

15 of the multiplexer;

a top detector for receiving the output voltage and outputting a top voltage;

a bottom detector for receiving the output voltage and outputting a bottom voltage;

20 a substractor for receiving the top voltage and the bottom voltage and outputting a voltage difference between the top voltage and the bottom voltage;

a target setting unit for generating a target voltage;

a first comparator for receiving the voltage difference of the substractor and the target voltage of the target setting unit and generating a control signal;

a charge pump for receiving the control signal and generating the first AGC voltage; and

a capacitor for receiving the first AGC voltage.

3. The AGC device according to claim 2, wherein the first control loop further

5 comprises a programmable low-pass filter for filtering high-frequency noises of the first AGC voltage.

4. The AGC device according to claim 1, wherein the second control loop

comprises:

10 a second comparator for receiving the first AGC voltage and the second AGC voltage and outputting a comparison signal;

an up/down counter for counting up or down the pulse number of a counting signal according to the comparison signal as an up/down control signal, and outputting a count value;

15 a digital-to-analog converter for converting the count value into the second AGC voltage;

a hold control unit for generating the hold signal according to a hold command; and

20 a counting signal generator for receiving the hold signal, outputting the counting signal with predetermined frequency when the hold signal is disabled, and holding the counting signal at a constant level when the hold signal is enabled.

5. The AGC device according to claim 4, wherein the second control loop further

comprises a count value protect logic for protecting the count value from

overflowing.

6. The AGC device according to claim 2, wherein the second control loop comprises:

a second comparator for receiving the first AGC voltage and the second AGC

voltage and outputting a comparison signal;

an up/down counter for counting up or down the pulse number of a counting

signal according to the comparison signal as an up/down control signal, and outputting a count value;

a digital-to-analog converter for converting the count value into the second

19 AGC voltage:

a hold control unit for generating the hold signal according to a hold command;

and

a counting signal generator for receiving the hold signal, outputting the counting signal with predetermined frequency when the hold signal is

disabled, and holding the counting signal at a constant level when the hold signal is enabled.

7. The AGC device according to claim 4, wherein the second control loop further comprises a count value protect logic for protecting the count value from overflowing.